

ing, and these semi-terete; the lateral nerves numerous, patent, and conjoined by veins. Corymbs axillary, few-flowered, either solitary or twin, sometimes cymose, sometimes racemose. Peduncles terete, often slightly angulate, from one to two inches long, rarely wanting. Pedicels as long as the peduncles, terete, solitary, gradually passing into the calyx. Calyx nearly campanulate, in age carnulent; the teeth at length 2—3 lines long. Corolla tender, lilac-blue, nearly all times of an equal colour, but rarely outside with exception of the wing-like part greenish, undulate at the margin; the lobes either rounded or emarginate. Stamens considerably shorter than the corolla; filaments very thin; anthers $1\frac{1}{2}$ lines long, opening at the apex, but also bursting more or less longitudinally. Style white, longer than the stamens. Stigma capitellate, bilobed. Berries when perfectly ripe pulpy, sometimes above one inch long. Seeds ovate-roundish, compressed, with a grey net-like tissue.

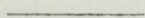


IX.

ON THE MINERAL WATERS OF VICTORIA.



BY JOHN MAUND, M.D.



READ APRIL 5, 1855.



My object in presenting for the inspection of the Institute this specimen of mineral water with a quantitative analysis of its composition, is principally to direct the attention of our members to the probable existence of many valuable mineral

springs, and to point out several which have already been discovered in Victoria.

Thus I may mention that I have met with two specimens of *acidulous* water derived from different parts of this Colony, one from Hepburn, near Castlemaine, and another from the banks of the Merri Creek, about thirty miles from Melbourne. A third, I have been told, exists at Ballan, of which I hope shortly to obtain a specimen. The waters derived from the two former localities contain a very considerable quantity of free carbonic acid gas, which imparts to them an agreeable and acidulous taste and a brisk and sparkling appearance. Time has only permitted me to make a quantitative analysis of the former, the results of which are the following.

RESULTS OF THE ANALYSIS OF MINERAL WATER
FROM HEPBURN.

	Per lb. Grains.	Per Gallon. Grains.
Carbonate of Lime . . .	4·747	47·470
Carbonate of Magnesia . .	2·570	25·700
Carbonate of Soda . . .	4·380	43·800
Carbonate of Iron . . .	0·100	1·000
Chloride of Sodium . . .	0·640	6·400
Sulphate of Soda . . .	0·223	2·230
Phosphate of Alumina . .	trace	trace
Phosphate of Lime . . .	0·030	0·300
Phosphate of Iron . . .	0·182	1·820
Alumina	0·100	1·000
Silicic Acid	0·330	3·300
Organic Matter	0·097	0·970
	13·399	133·990

The quantity of carbonic acid I have not yet definitely ascer-

tained, as accurate results could only be obtained by its estimation being made at the spring, but I believe from the experiments I have instituted, that 100 cubic inches of water will contain at least 100 cubic inches of the gas. The water now produced, which was derived from Hepburn, I should feel inclined to class as an acidulo carbonated chalybeate. It would, however, I am aware, by some authorities, from the small quantity of iron that it contains, be classed merely as an acidulo alkaline; and indeed, as the presence of iron does not render the taste disagreeable, it might with equal propriety be classed under either head. Acidulous waters of this kind have always been held in high esteem, even so early as the time of Pliny (who was about coeval with our Saviour) who particularly mentions a spring of this description which existed in Macedonia, which he states possessed intoxicating properties (*Lyncestis aqua, quæ vocatur acidula, vino modo temulentos facit*), and for which properties the Pymont water is said now to be extensively drunk by the country people. This effect doubtless depends upon the large amount of carbonic acid the water contains.

Great Britain possesses, as far as is yet known, only one acidulous spring, this exists at Ilkeston, in Derbyshire, and has acquired considerable celebrity, although its properties are far less deserving of attention than those of the water now presented for the inspection of the society.

The imperial gallon of the Ilkeston water contains only about 36 grains of saline matter per gallon, while that of Hepburn contains about 144 grains in the same amount. The importance of such springs to the Colony will be readily appreciated when we consider that they are of the same class, and, I believe, equal in every respect to the far famed Seltzer Water of Germany, which attracts such hosts of travellers to the Rhine, and is so extensively imported into England and elsewhere, thereby producing a considerable revenue to the country affording it. The water now shown, from the cork

having been frequently removed from the bottle, has lost its free carbonic acid, and consequently its acidulous taste. It is now instead strongly saline and alkaline, and although the water is now clear, I should mention that a portion of the salts have been deposited, owing to the escape of carbonic acid, the presence of which kept them in solution.

The medicinal effect of the Hepburn and other waters I have referred to are not of a slight character. The excess of carbonic acid makes them refreshing and exhilarating, and useful in allaying nausea and irritation of the stomach, while the salts they contain act directly on the renal and digestive organs, rendering them extremely beneficial in hepatic, gouty, rheumatic, and other affections. In addition to the acidulous waters I have seen several specimens of saline waters, derived from springs which exist mostly on the sides of creeks; I believe, ultimately, springs of this class will be found in many parts of the Colony.

The composition of those I have analysed consist chiefly of chlorides of sodium, magnesium, and calcium, with sulphates of soda, magnesia, and lime, and occasionally iron, alumina, and traces of potash.

I have been informed that near the Ovens Diggings a sulphureous spring exists, but a specimen of this water I have not been able to procure; I trust, however, some member of our Society, who has friends in that neighbourhood, will be more fortunate, and present the Institute with a specimen.

The specimen of white powder now shown (which was sent to me by Mr. Moody as a product of the Anderson's Creek Diggings) is the remains of some beautiful, transparent, naturally formed crystals, which have now from exposure to the air effloresced. These I believe to have been the solid portion of a saline mineral water, which percolating through a rock into a cavity, were deposited in consequence of the evaporation of the aqueous part, leaving the inorganic constituents in crystals on the sides of the cavern. The crystals

consist mostly of sulphates and carbonate of soda, with small portions of phosphate of soda, sulphate of magnesia, and potash, there being an entire absence of chloride of sodium and chlorine.

X.

ON GAS AND GAS WORKS.

BY A. K. SMITH, ESQ., C.E., F.R.S.SA., &c.

ENGINEER AND MANAGER OF THE CITY OF
MELBOURNE GAS WORKS.

READ MAY 3, 1855.

MR. CHAIRMAN AND GENTLEMEN,—I beg to preface my remarks on Gas and Gas Works by stating that, although I have had considerable experience in the erection of gas works, the manufacture of coal gas, and its introduction to towns and houses for public and private uses, yet I have found it advisable to refer to such authorities as Dr. Fyfe, Messrs. Thompson, Faraday, Hughes, Gore, Rutter, &c., &c., regarding its early history, chemical analysis, &c., &c.; and as there are several interesting papers to be read this evening, I shall not attempt more than to give a brief outline of:—

- 1st. The history and nature of coal gas.
- 2nd. A description of the works necessary for its manufacture.
- 3rd. The adaption of these works to suit local circumstances.